

REMARKS

Status of the Application

In the Non-Final Office Action dated April 2, 2008, pending Claims 1-30 and 46-53 were rejected. Applicants respectfully traverse these rejections. Thus, Claims 1-30 and 46-53 are currently pending in this application. No new matter was added.

Rejections Under 35 U.S.C. § 103(a)

Examiner has rejected Claims 1-4, 6-10, and 12-15 under 35 U.S.C. § 103(a) as being obvious in view of Casey et al. (WO 01/68962 A2; hereinafter "Casey") in combination with Hernandez et al. (U.S. Published Patent Application No. 2002/0071951 A1; hereinafter "Hernandez") and Abe et al. (U.S. Patent No. 6,572,967; hereinafter "Abe"). Examiner further rejected Claims 16-20, 22-26, and 28-30 under 35 U.S.C. § 103(a) as being obvious in view of Casey in combination Abe. More specifically, Examiner asserts that Casey, whether taken alone (as for Claims 16-20, 22-26, and 28-30) or in combination with Hernandez (as for Claims 1-4, 6-10, and 12-15), teaches all limitations of the rejected claims with the exception of the limitation requiring the quench zone to be shorter than 16 feet. However, Examiner nevertheless finds this limitation to be obvious because 1) "the prior art range of Casey et al does not significantly deviate from the claimed range," 2) Abe teaches quench zones shorter than 6 feet and it would have been obvious to combine Abe with Casey (and Hernandez) to arrive at the present invention, and 3) "all of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed" to arrive at the present invention. Applicants respectfully disagree with all three of Examiner's rationales for finding the quench zone length limitation obvious, and, thus, respectfully traverse these rejections.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art" (MPEP § 2143.03, citing *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)). In addition, "[t]he prior art can be modified or combined to reject claims as *prima facie* obvious as long as there is a reasonable expectation of success" (MPEP § 2143.02, citing *In re*

Merck & Co., Inc., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)). This includes situations where there is no explicit teaching, motivation, or suggestion in the prior art to make the claimed modification or combination, but the combination or modification would have been obvious to try given the state of knowledge in the art at the time the application was filed (*KSR Int'l v. Teleflex Inc.*, 127 S.Ct. 1727, 1742, 82 USPQ2d 1385, 1397 (2007)). To that end, “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results” (*Id.* at S. Ct. 1739, USPQ2d 1395). On the other hand, “[t]he fact that the elements work[] together in an unexpected and fruitful manner support[s] the conclusion that [an invention’s] design [is] not obvious to those skilled in the art” (*Id.* at S. Ct. 1740, USPQ2d 1396 (reviewing *United States v. Adams*, 383 U.S. 39, 40, 148 USPQ 179, 180 (1966))). Said another way, proof of unexpected improvement is persuasive rebuttal of a *prima facie* case of obviousness (*In re Murch*, 464 F.2d 1051, 1054, 175 USPQ 89, 92 (CCPA 1972)). Also relevant to the obviousness inquiry is the fact that, “[a] prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention” (MPEP § 2143.02.VI, citing *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983)), and “[a] prior art reference that ‘teaches away’ from the claimed invention is a significant factor to be considered in determining obviousness” (MPEP § 2145.X.D.1.). Further, “[i]t is improper to combine references where the references teach away from their combination” (MPEP § 2145.X.D.2., citing *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983)). It must also be noted that, “[t]he examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness” (MPEP § 2142).

Under this legal framework, the above cited combination of references fails to make obvious Claims 1-4, 6-10, 12-20, 22-26, and 28-30 of the present invention. First, as Examiner implicitly recognizes, Casey fails to teach or even suggest the limitation of Claims 1 and 16 requiring the quench zone length to be shorter than 16 feet. Instead, Casey teaches quench zones of 16 to 20 feet (Casey at page 9, lines 9-15). However, despite this failure of Casey to teach the

quench zone length limitation, Examiner finds that it would have been obvious to employ such a limitation in the invention of Casey because “the prior art range of Casey et al does not significantly deviate from the claimed range” (April 2, 2008, Office Action at pages 4 and 6). In making this rejection, Examiner cites *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1376, 77 USPQ2d 1321, 1327 (Fed. Cir. 2005) (hereinafter “*Perricone*”), as support for the proposition that a claimed range can be made obvious by a non-overlapping range in the prior art as long as the ranges do not “significantly deviate,” i.e., the ranges are close to one another. However, this is a gross mischaracterization of the holding in *Perricone*. In reality, *Perricone* states that when a prior art range *completely overlaps* the claimed range and *also* does not significantly deviate from the claimed range, i.e., the claimed range is not much smaller than the prior art range, then the claimed range can properly be deemed obvious in view of that reference. To that end, the court in *Perricone* states that the prior art range “*entirely encompasses*, and does not significantly deviate from, [the inventor’s] claimed ranges,” and therefore the finding that the claimed range is taught by this reference was proper (*Perricone* at F.3d 1376, USPQ2d 1327 (emphasis added)). In reaching this conclusion, the *Perricone* court also cites *Atlas Powder Co. v. IRECO Inc.*, 190 F. 3d 1342, 1346, 51 USPQ2d 1943, 1945 (Fed. Cir. 1999), which reached a similar conclusion, stating that “[w]hen a patent claims a chemical composition in terms of ranges of elements, any single prior art reference that *falls within* each of the ranges anticipates the claim” (emphasis added). In the present case, the prior art range neither “falls within” nor “entirely encompasses” the claimed range, but rather the claimed range of shorter than 16 feet and the prior art range of 16 to 20 feet are completely non-overlapping. As such, Examiner’s first rationale for finding the quench zone limitation of Claims 1 and 16 obvious in view of the cited references is improper.

Examiner’s second rationale for finding the “shorter than 16 feet” quench zone length limitation obvious is that Abe teaches quench zones of 170 cm (approximately 6 feet), and that it would have been obvious to combine Abe with Casey (and Hernandez where applicable) to arrive at the present invention. However, Applicants assert that such a combination would not have been

obvious to one of ordinary skill in the art given the disparate teachings of the cited references.

The present invention is directed toward processes for producing staple fibers from aged, undrawn PTT fibers on essentially conventional equipment (Published Application at [0011]). Aged fibers are defined in the Specification as fibers stored for "several days" after spinning (Published Application at [0021]). The present application also describes some of the difficulties associated with drawing aged PTT fibers, such as that PTT fibers "can become brittle upon aging (e.g., storage)" and "[b]rittle fibers can be difficult to draw and may even be undrawable" (Published Application at [0007]). This is a rather important problem since "[c]onventional two-step processes used for making polyester staple fibers . . . include an inherent time delay between the extrusion and drawing process, which effectively ages the fibers" (Published Application at [0007]). The fact that problems associated with drawing aged PTT fibers are widely recognized in the art is evident from the fact that multiple prior art references exist which try to overcome this problem (see, e.g., U.S. Patent No. 6,109,015, discussed at [0008] of the Published Application). Casey is one such reference (see, e.g., Casey at page 1, line 25-page 2, line 19; page 10, line 33- page 11, line 10; page 17, lines 19-35). One way in which Casey attempts to abate this problem is to use relatively long quench zones to control the shrinkage that contributes to the difficulties encountered with aged PTT fibers (see, e.g., Casey at page 9, lines 9-15). To that end, Casey specifically teaches that quench zone lengths greater than 16 feet are required (Casey at page 9, lines 9-12). In contrast, Abe is specifically directed toward un-aged fibers and yarns. Evidence of this fact can be seen, e.g., in Examples 1-3 of Abe, the very Examples cited by Examiner as describing a quench zone of 170 cm. In these examples the "Lag time" of the "Drawing Conditions" is stated to be "within 50 hours" of the spinning (Abe at column 11, lines 29-30). Thus, the fibers of Abe are not aged, as in Casey and the present application, but rather are drawn within about 2 days or less after spinning. Given the fact that Abe is directed toward drawing un-aged fibers, which are well known in the art to require different processes than the aged fibers of Casey, one skilled in the art would not be motivated to combine Casey with

Abe to arrive at the present invention. As such, the present application should be deemed nonobvious over these references. Further, Casey's disclosure that long quench zones are required to avoid shrinkage of yarn during aging plainly teaches away from the short quench zone employed in Abe and the present invention. Given that "[a] prior art reference that 'teaches away' from the claimed invention is a significant factor to be considered in determining obviousness," and that "[i]t is improper to combine references where the references teach away from their combination," the present invention must again be deemed nonobvious over this combination of references.

Examiner's final rationale for finding the quench zone lengths of the present application obvious is that "all of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed with no change in their respective functions, and the combination would have yielded nothing more than predictable results," citing as the basis for this rejection *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 82 USPQ2d 1385 (2007) (hereinafter "*KSR*"). Applicants respectfully disagree.

The present application is directed toward a problem that was well known in the prior art, namely preparing high quality yarns from aged, undrawn PTT fibers on essentially conventional equipment (see, e.g., Published Application at [0011]). As discussed above, it is well known in the art that producing yarns from aged PTT fibers using conventional equipment is problematic due to the difficulties that arise when PTT fibers are aged (see, e.g., Published Application at [0007]). That this problem is well known in the art, and that a solution to this problem has been long-felt, can be found in the fact that there are many published prior art references which attempt to alleviate the problems associated with aged PTT fibers (see, e.g., U.S. Patent No. 6,109,015 and WO 01/68962 A2, discussed at [0008] and [0009] of the Published Application, respectively). However, most prior art attempts at alleviating this problem did not utilize conventional equipment. Moreover, references which did use conventional equipment as a starting point generally relied upon some significant equipment modification to correct the problem. For instance, the PTT yarns of Casey were produced on equipment with quench zones that were "16 to 20 feet [long] *rather*

than the standard 8-12 feet" (Casey at page 9, lines 9-12 (emphasis added)).

Such a modification is quite substantial as it requires that all downstream parts of the process be moved or otherwise adjusted to allow for an additional 4-8 feet of quench zone length. Given such a state of knowledge in the prior art, it is in no way "predictable" that conventional equipment, including quench zones shorter than 16 feet, could be successfully employed in the production of yarn from aged PTT fibers, as in the present invention. Instead, though the use of shorter quench zones in some applications was generally known in the art, their use in the present invention produces the unexpected result of delivering high quality PTT yarns from aged fibers. Said another way, in the present invention "the elements work[] together in an unexpected and fruitful manner [which] support[s] the conclusion that [the present invention's] design [is] not obvious to those skilled in the art" (*Id.* at S. Ct. 1740, USPQ2d 1396). Therefore, the claims of the present invention, including the quench zone length limitation, should not be deemed obvious over Casey under *KSR*'s holding.

For all of the foregoing reasons, Applicants assert that Claims 1-4, 6-10, 12-20, 22-26, and 28-30 should be deemed nonobvious over Casey, in combination with Hernandez, where applicable, in combination with Abe. As such, Applicants respectfully request that these rejections be withdrawn and the claims allowed.

Examiner further rejected Claims 5 and 21 under 35 U.S.C. § 103(a) as being obvious in view of Casey in combination with Hernandez, where applicable, and Abe, and further in combination with Bull et al. (GB 992,670 A; hereinafter "Bull"). More specifically, Examiner finds all limitations of Claims 1 and 16, upon which Claims 5 and 21 respectively depend, to be taught by Casey, Hernandez, and Abe, as discussed above, with the additional limitations of Claims 5 and 21 being supplied by Bull. For the reasons set forth above, Applicants assert that independent Claims 1 and 16 are not made obvious by any combination of Casey, Hernandez, and Abe. As such, Claims 5 and 21, which depend upon and therefore are necessarily narrower than Claims 1 and 16, should also be deemed nonobvious. Applicants therefore respectfully request that these rejections be withdrawn and the claims allowed.

Examiner additionally rejected Claims 11 and 27 under 35 U.S.C. § 103(a) as being obvious in view of Casey in combination with Hernandez, where applicable, and Abe, and further in combination with Chuah et al. (U.S. Patent No. 6,113,825; hereinafter "Chuah"). More specifically, Examiner finds all limitations of Claims 1 and 16, upon which Claims 11 and 27 respectively depend, to be taught by Casey, Hernandez, and Abe, as discussed above, with the additional limitation of Claims 11 and 27 relating to draw temperature being supplied by Chuah. For the reasons set forth above, Applicants assert that independent Claims 1 and 16 are not made obvious by any combination of Casey, Hernandez, and Abe. As such, Claims 11 and 27, which depend upon and therefore are necessarily narrower than Claims 1 and 16, should also be deemed nonobvious. In addition, Applicants contend that one skilled in the art would not be motivated to combine Chuah with Casey, Hernandez, and Abe to arrive at the present invention, again making these claims nonobvious over this combination of references.

As discussed at length above, the present invention is directed toward processes for producing staple fibers from aged, undrawn PTT fibers (Published Application at [0011]). Aged fibers are defined in the Specification as fibers stored for "several days" after spinning (Published Application at [0021]). The present application also describes some of the difficulties associated with drawing aged PTT yarns, such as that PTT fibers "can become brittle upon aging (e.g., storage)" and "[b]rittle fibers can be difficult to draw and may even be undrawable" (Published Application at [0007]). This is a rather important problem since "[c]onventional two-step processes used for making polyester staple fibers . . . include an inherent time delay between the extrusion and drawing process, which effectively ages the fibers" (Published Application at [0007]). Casey is also directed toward solving problems associated with drawing aged PTT fibers, though in a different manner (see. e.g., Casey at page 1, line 25-page 2, line 19; page 10, line 33- page 11, line 10; page 17, lines 19-35). In contrast, Chuah is directed toward drawing completely un-aged PTT – in Chuah the fibers are spun and then immediately drawn. Because of this fundamental difference between Chuah and Casey, one skilled in the art would in no way be motivated to even try

the first draw stage temperature of Chuah in the process of Casey to arrive at the present invention. Moreover, Casey actually teaches away from the draw temperatures of Chuah (and the present invention), further demonstrating the nonobviousness of Claims 11 and 27 over these references. Casey states at page 18, lines 20-22 that “[d]rawing at temperatures above 60°C is recommended.” This clearly teaches away from the use of draw temperatures less than 60°C, as are employed in Chuah and the present invention, in processes involving the drawing of *aged* PTT fibers. Because “[i]t is improper to combine references where the references teach away from their combination” and “[a] prior art reference that ‘teaches away’ from the claimed invention is a significant factor to be considered in determining obviousness,” this adverse teaching of Casey would again make it nonobvious to employ the draw temperatures of Chuah in the process of Casey to arrive at the present invention. For all of these reasons, Applicants submit that Claims 11 and 27 of the present application should be deemed nonobvious in view of this combination of references. Applicants therefore respectfully request that these rejections be withdrawn and all claims allowed.

Lastly, Examiner rejected Claims 46-53 under 35 U.S.C. § 103(a) as being obvious in view of Casey, in combination with Hernandez, where applicable, and further in combination with Chuah. More specifically, Examiner finds all limitations of these claims to be taught by Casey, whether taken alone or in combination with Hernandez, with the exception of the first draw temperature limitations. However, Examiner asserts that it would have been obvious to one skilled in the art to employ a first draw temperature of less than 60°C as in Claims 46, 48-50, 52, and 53 because “the prior art range of Casey et al does not significantly deviate from the claimed range.” Moreover, Examiner asserts that it would have been obvious to one skilled in the art to employ the draw temperature limitations of all these claims because 1) Chuah teaches first draw temperatures of 40°C-80°C and it would have been obvious to combine Chuah with Casey (and Hernandez) to arrive at the present invention, and 2) “all of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed” to arrive at the present invention. Applicants respectfully

disagree with all three of Examiner's rationales for finding the draw temperature limitations obvious, and, thus, respectfully traverse these rejections.

First, Examiner finds that it would have been obvious to employ the "less than 60°C" first draw temperatures of Claims 46, 48-50, 52, and 53 in the invention of Casey because "the prior art range of Casey et al does not significantly deviate from the claimed range" (April 2, 2008, Office Action at pages 4 and 6). In making this rejection, Examiner again cites *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1376, 77 USPQ2d 1321, 1327 (Fed. Cir. 2005) (hereinafter "*Perricone*"), as support for the proposition that a claimed range can be made obvious by a non-overlapping range in the prior art as long as the ranges do not "significantly deviate," i.e., the ranges are close to one another. However, as discussed above, this is a gross mischaracterization of the holding in *Perricone*. In reality, *Perricone* states that when a prior art range *completely overlaps* the claimed range and *also* does not significantly deviate from the claimed range, i.e., the claimed range is not much smaller than the prior art range, then the claimed range can properly be deemed obvious in view of that reference. To that end, the court in *Perricone* states that the prior art range "*entirely encompasses*, and does not significantly deviate from, [the inventor's] claimed ranges" and therefore the finding that the claim range is taught by this reference was proper (*Perricone* at F.3d 1376, USPQ2d 1327 (emphasis added)). In reaching this conclusion, the *Perricone* court also cites *Atlas Powder Co. v. IRECO Inc.*, 190 F. 3d 1342, 1346, 51 USPQ2d 1943, 1945 (Fed. Cir. 1999), which reaches a similar conclusion, stating that "[w]hen a patent claims a chemical composition in terms of ranges of elements, any single prior art reference that *falls within* each of the ranges anticipates the claim" (emphasis added). In the present case, the prior art range neither "falls within" nor "entirely encompasses" the claimed range, but rather the claimed range of less than 60°C and the prior art range of at least 60°C are completely non-overlapping. As such, Examiner's first rationale for finding the draw temperature limitation of Claims 46, 48-50, 52, and 53 obvious in view of the cited references is improper.

Examiner's second rationale for finding the claimed quench zone lengths obvious is that Chuah teaches first draw temperatures of 40°C to 80°C, and that it

would have been obvious to combine Chuah with Casey (and Hernandez where applicable) to arrive at the present invention. However, Applicants assert that such a combination would not have been obvious to one of ordinary skill in the art given the disparate teachings of the cited references. As discussed in detail for Claims 11 and 27, above, the present invention is directed toward processes for producing staple fibers from aged, undrawn PTT fibers (Published Application at [0011]). Aged fibers are defined in the Specification as fibers stored for “several days” after spinning (Published Application at [0021]). The present application also describes some of the difficulties associated with drawing aged PTT yarns, such as that PTT fibers “can become brittle upon aging (e.g., storage)” and “[b]rittle fibers can be difficult to draw and may even be undrawable” (Published Application at [0007]). This is a rather important problem since “[c]onventional two-step processes used for making polyester staple fibers . . . include an inherent time delay between the extrusion and drawing process, which effectively ages the fibers” (Published Application at [0007]). Casey is also directed toward solving problems associated with drawing aged PTT fibers, though in a different manner (see. e.g., Casey at page 1, line 25-page 2, line 19; page 10, line 33-page 11, line 10; page 17, lines 19-35). In contrast, Chuah is directed toward drawing completely un-aged PTT fibers – in Chuah the fibers are spun and then immediately drawn. Because of this fundamental difference between Chuah and Casey, one skilled in the art would in no way be motivated to even try the first draw stage temperature of Chuah in the process of Casey to arrive at the present invention. Moreover, Casey actually teaches away from the draw temperatures of Chuah (and the present invention), further demonstrating the nonobviousness of Claims 11 and 27 over these references. Casey states at page 18, lines 20-22 that “[d]rawing at temperatures above 60°C is recommended.” This clearly teaches away from the use of draw temperatures less than 60°C, as are employed in Chuah and the present invention, in processes involving the drawing of *aged* PTT fibers. Because “[i]t is improper to combine references where the references teach away from their combination” and “[a] prior art reference that ‘teaches away’ from the claimed invention is a significant factor to be considered in determining obviousness,” this adverse teaching of Casey would again make it nonobvious to employ the draw temperatures of Chuah in the process of Casey

to arrive at the present invention. For all of these reasons, Applicants submit that Claims 46-53 of the present application should be deemed nonobvious in view of this combination of references.

Examiner's final rationale for finding the draw temperature limitations of Claims 46-53 of the present application obvious is that "all of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed with no change in their respective functions, and the combination would have yielded nothing more than predictable results," citing as the basis for this rejection *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727 , 82 USPQ2d 1385 (2007) (hereinafter "*KSR*"). Applicants respectfully disagree.

As discussed above, the present application is directed toward a problem that was well known in the prior art, namely preparing high quality yarns from aged, undrawn PTT fibers on essentially conventional equipment (see, e.g., Published Application at [0011]). Casey is also directed toward solving problems associated with drawing aged PTT fibers, though in a different manner (see. e.g., Casey at page 1, line 25-page 2, line 19; page 10, line 33- page 11, line 10; page 17, lines 19-35). However, in the solution disclosed therein, Casey states at page 18, lines 20-22 that "[d]rawing at temperatures above 60°C is recommended." Given such a state of knowledge in the art, it is in no way "predictable" that first draw temperatures of less than 60°C or of 50°C to 55°C could be successfully employed in an aged PTT yarn production operation, as in the present invention. Instead, though draw temperatures less than 60°C were generally known in the art, their use in the present invention produces the unexpected result of delivering high quality PTT yarns from aged fibers. Said another way, in the present invention "the elements work[] together in an unexpected and fruitful manner [which] support[s] the conclusion that [the present invention's] design [is] not obvious to those skilled in the art" (*Id.* at S. Ct. 1740, USPQ2d 1396). Therefore, Claims 46-53 of the present application, including the draw temperature limitations, should not be deemed obvious over Casey under *KSR*'s holding.

For all of the foregoing reasons, Applicants contend that Claims 46-53 should be deemed nonobvious over Casey, in combination with Hernandez,

where applicable, in combination with Chuah. As such, Applicants respectfully request that these rejections be withdrawn and the claims allowed.

In light of the above, Applicants submit that no combination of Casey, Hernandez, Abe, and Chuah makes obvious any of pending Claims 1-30 and 46-53 of the present application. Applicants therefore respectfully request that the obviousness rejections to all claims be withdrawn and all claims allowed.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants submit that this application is in condition for allowance. In order to expedite disposition of this case, the Examiner is invited to contact Applicants' representative at the telephone number below to resolve any remaining issues. Should there be a fee due which is not accounted for, please charge such fee to Deposit Account No. 04-1928 (E.I. du Pont de Nemours and Company).

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